

## CLAIMS

What is claimed is:

1 1. A method of relating data stored in one or more content management systems for an  
2 enterprise, the method comprising the steps of:  
3 managing a plurality of information chunks in one or more content management  
4 systems, each chunk of the plurality of information chunks comprising a unit  
5 of data for storage and retrieval operations; and  
6 managing a vocabulary database comprising a plurality of data structures describing  
7 atomic concepts among names in an enterprise-specific vocabulary and a  
8 plurality of data structures describing relationships among the atomic  
9 concepts,  
10 wherein the plurality of data structures describing atomic concepts include a first  
11 information object data structure comprising data indicating a first reference to  
12 a first chunk in the one or more content management systems, and  
13 wherein the plurality of data structures describing relationships include a first  
14 relationship data structure describing a relationship between the first  
15 information object data structure and a second concept data structure of the  
16 plurality of data structures describing atomic concepts.

1 2. The method of claim 1, wherein the second concept is different than the first  
2 information object.

1 3. The method of claim 1, wherein the first relationship data structure describes the  
2 relationship involving a third concept data structure of the plurality of data structures  
3 describing atomic concepts.

1 4. The method of claim 1, wherein the relationships include relationships of a child-of  
2 relationship type; a hierarchy is a subset of the atomic concepts related by a series of one or  
3 more relationships of the child-of relationship type to a root concept of the atomic concepts;  
4 and the second concept data structure describes a concept that belongs to a particular  
5 hierarchy having a particular root concept.

1 5. The method of claim 4, wherein the particular root concept is one of an information  
2 type root concept, a document type root concept, a product type root concept, a technology  
3 type root concept, a solution type root concept, and a user type root concept.

1 6. The method of claim 5, wherein the first relationship data structure describes the  
2 relationship involving a third concept data structure of the plurality of data structures  
3 describing atomic concepts; and the third concept data structure describes a concept that  
4 belongs to a different hierarchy having a different root concept.

1 7. The method of claim 1, wherein the first chunk is one of a block of text, an  
2 application, a query for a database, a vector graphic, an image, audio data, and video data.

1 8. The method of claim 1, wherein the first reference comprises one of a file name, a  
2 network resource address, a universal resource locator (URL) address, a record identification  
3 in a predetermined database, a record identification in a predetermined content management  
4 system.

1 9. The method of claim 1, wherein the plurality of information chunks reside in a  
2 plurality of content management systems; and said step of managing the plurality of  
3 information chunks further comprises employing a data integration tool to retrieve the first  
4 chunk from a content management system that resides on a remote platform accessible  
5 through a network.

1 10. The method of claim 1, further comprising the step of generating and storing a subset  
2 of the plurality of information chunks into a content cache based at least in part on data in a  
3 second relationship data structure describing a second relationship of the relationships.

1 11. The method of claim 10, further comprising the step of generating and storing a  
2 subset of the vocabulary database into a concept cache based at least in part on data in the  
3 second relationship data structure.

1 12. The method of claim 11, further comprising the step of generating a page for sending  
2 over a network to a client process based on data in the concept cache and the content cache.

1 13. The method of claim 12, wherein the page is organized based at least in part on data  
2 in a relationship data structure in the concept cache.

1 14. The method of claim 12, wherein the page displays information based on at least one  
2 information chunk in the content cache.

1 15. The method of claim 11, further comprising the step of editing at least one of the  
2 concept cache and the content cache.

1 16. The method of claim 10, said step of generating and storing the subset of the plurality  
2 of information chunks further comprising combining at least two information chunks of the  
3 plurality of information chunks into a single information chunk in the content cache.

1 17. The method of claim 16, wherein the at least two information chunks have  
2 corresponding information object data structures which are related to corresponding concept  
3 data structures; and at least two of the corresponding concept data structures are related by  
4 the second relationship.

1 18. The method of claim 11, said step of generating and storing a subset of the vocabulary  
2 database into a concept cache further comprising de-normalizing the concept cache to  
3 improve speed of retrieval by allowing a concept data structure for a concept that participates  
4 in more than one relationship to be stored more than once in the concept cache.

1 19. The method of claim 1, said managing the plurality of information chunks comprising  
2 employing a first set of software tools including at least one of tools for defining the first  
3 information object data structure type and instance and for defining the first relationship data  
4 structure type and instance.

1 20. The method of claim 1, further comprising the steps of generating and storing a first  
2 subset of the plurality of information chunks into a first content cache for managing content  
3 of a Web page.

1 21. The method of claim 20, further comprising the step of managing the first subset by  
2 employing a second set of software tools including at least one of tools for editing the first  
3 information object data structure, for editing the first relationship data structure, for  
4 populating the first content cache, for populating a first concept cache, for retrieving from the  
5 first content cache, for combining two or more information chunks into a new information  
6 chunk, and for de-normalizing the first concept cache to improve speed of retrieval by  
7 allowing a concept data structure for a concept that participates in more than one relationship  
8 to be stored more than once in the first concept cache.

1 22. The method of claim 20, wherein the first subset of the plurality of information  
2 chunks excludes information chunks that have become obsolete.

1 23. The method of claim 20, wherein the first subset of the plurality of information  
2 chunks excludes information chunks that have not been released.

24. The method of claim 20, further comprising the steps of generating and storing a second subset of the first content cache into a second content cache for staging content for the Web page.

25. The method of claim 24, further comprising the step of managing the second subset by employing a third set of software tools including at least one of tools for editing the first information object data structure, for populating the second content cache, for populating a second concept cache, for ensuring each information chunk in the second content cache has an information object data structure and a relationship to another concept in the second concept cache, and for forming a search index for the second content cache.

26. The method of claim 24, further comprising the step of replicating the second content cache to one or more Web servers for providing content to a Web page generating process on each of the one or more Web servers.

27. A method of arranging content for a Web page, the method comprising the steps of:  
managing a plurality of information chunks in a content cache, each chunk of the plurality of information chunks retrieved by a directory address; and  
managing a plurality of data structures describing atomic concepts among names in an enterprise-specific vocabulary and a plurality of data structures describing relationships among the atomic concepts in a concept cache; and  
arranging content on the Web page based at least in part on data in the concept cache.

28. The method of Claim 27, wherein the content is based on data in the content cache.

29. The method of Claim 27, wherein the data in the concept cache includes a first relationship data structure relating a first concept data structure to a second concept data structure of the data structures describing atomic concepts.

1 30. The method of Claim 29, wherein the content is based on at least a first information  
2 chunk having a first directory address; the first directory address is indicated by data in a  
3 third concept data structure of the data structures describing atomic concepts; and a second  
4 relationship data structure relates the third concept data structure to at least one of the first  
5 concept data structure and the second concept data structure.

1 31. The method of Claim 27, wherein a first relationship data structure relates a first  
2 concept data structure to a second concept data structure of the data structures describing  
3 atomic concepts; a second relationship data structure relates the second concept data structure  
4 to a third concept data structure of the data structures describing atomic concepts; and the  
5 content is based on at least a first information chunk having a first directory address indicated  
6 by data in the third concept data structure.

1 32. A method of relating data stored in one or more content management systems for an  
2 enterprise, the method comprising the steps of :  
3 managing a plurality of information chunks in one or more content management  
4 systems, each chunk of the plurality of information chunks comprising a unit  
5 of data for storage and retrieval operations;  
6 managing a vocabulary database comprising a plurality of data structures describing  
7 atomic concepts among names in an enterprise-specific vocabulary and a  
8 plurality of data structures describing relationships among the atomic  
9 concepts, and  
10 arranging content in a document based at least in part on data in the vocabulary  
11 database, the content based at least in part on an information chunk of the  
12 plurality of information chunks.

1 33. A method of relating data stored in one or more content management systems for an  
2 enterprise, the method comprising the steps of:  
3 managing a plurality of information chunks in one or more content management  
4 systems, each chunk of the plurality of information chunks comprising a unit  
5 of data for storage and retrieval operations;  
6 managing a vocabulary database comprising a plurality of data structures describing  
7 atomic concepts among names in an enterprise-specific vocabulary and a  
8 plurality of data structures describing relationships among the atomic  
9 concepts;  
10 generating and storing a first subset of the plurality of information chunks into a first  
11 content cache for managing content of a Web page; and  
12 generating and storing a second subset of the first content cache into a second content  
13 cache for staging content for the Web page for replication to one or more Web  
14 servers,  
15 wherein the plurality of data structures describing atomic concepts include a first  
16 information object data structure comprising data indicating a first reference to  
17 a first chunk in the one or more content management systems, and  
18 wherein the plurality of data structures describing relationships include a first  
19 relationship data structure describing a relationship between the first  
20 information object data structure and a second concept data structure of the  
21 plurality of data structures describing atomic concepts.

1 34. A computer-readable medium carrying one or more sequences of instructions for  
2 relating data stored in one or more content management systems for an enterprise, which  
3 instructions, when executed by one or more processors, cause the one or more processors to  
4 carry out the steps of:  
5 managing a plurality of information chunks in one or more content management  
6 systems, each chunk of the plurality of information chunks comprising a unit  
7 of data for storage and retrieval operations; and

8 managing a vocabulary database comprising a plurality of data structures describing  
9 atomic concepts among names in an enterprise-specific vocabulary and a  
10 plurality of data structures describing relationships among the atomic  
11 concepts,  
12 wherein the plurality of data structures describing atomic concepts include a first  
13 information object data structure comprising data indicating a first reference to  
14 a first chunk in the one or more content management systems, and  
15 wherein the plurality of data structures describing relationships include a first  
16 relationship data structure describing a relationship between the first  
17 information object data structure and a second concept data structure of the  
18 plurality of data structures describing atomic concepts.

1 35. A computer-readable medium carrying one or more sequences of instructions for  
2 arranging content for a Web page, which instructions, when executed by one or more  
3 processors, cause the one or more processors to carry out the steps of:  
4 managing a plurality of information chunks in a content cache, each chunk of the  
5 plurality of information chunks retrieved by a directory address; and  
6 managing a plurality of data structures describing atomic concepts among names in an  
7 enterprise-specific vocabulary and a plurality of data structures describing  
8 relationships among the atomic concepts in a concept cache; and  
9 arranging content on the Web page based at least in part on data in the concept cache.

1 36. A computer-readable medium carrying one or more sequences of instructions for  
2 relating data stored in one or more content management systems for an enterprise, which  
3 instructions, when executed by one or more processors, cause the one or more processors to  
4 carry out the steps of:  
5 managing a plurality of information chunks in one or more content management  
6 systems, each chunk of the plurality of information chunks comprising a unit  
7 of data for storage and retrieval operations;



8 managing a vocabulary database comprising a plurality of data structures describing  
9 atomic concepts among names in an enterprise-specific vocabulary and a  
10 plurality of data structures describing relationships among the atomic  
11 concepts, and  
12 arranging content in a document based at least in part on data in the vocabulary  
13 database, the content based at least in part on an information chunk of the  
14 plurality of information chunks.

1 37. A computer-readable medium carrying one or more sequences of instructions for  
2 relating data stored in one or more content management systems for an enterprise, which  
3 instructions, when executed by one or more processors, cause the one or more processors to  
4 carry out the steps of:  
5 managing a plurality of information chunks in one or more content management  
6 systems, each chunk of the plurality of information chunks comprising a unit  
7 of data for storage and retrieval operations;  
8 managing a vocabulary database comprising a plurality of data structures describing  
9 atomic concepts among names in an enterprise-specific vocabulary and a  
10 plurality of data structures describing relationships among the atomic  
11 concepts;  
12 generating and storing a first subset of the plurality of information chunks into a first  
13 content cache for managing content of a Web page; and  
14 generating and storing a second subset of the first content cache into a second content  
15 cache for staging content for the Web page for replication to one or more Web  
16 servers,  
17 wherein the plurality of data structures describing atomic concepts include a first  
18 information object data structure comprising data indicating a first reference to  
19 a first chunk in the one or more content management systems, and  
20 wherein the plurality of data structures describing relationships include a first  
21 relationship data structure describing a relationship between the first  
22 information object data structure and a second concept data structure of the  
23 plurality of data structures describing atomic concepts.

1 38. A system for relating data stored in one or more content management systems for an  
2 enterprise, comprising:  
3 means for managing a plurality of information chunks in one or more content  
4 management systems, each chunk of the plurality of information chunks  
5 comprising a unit of data for storage and retrieval operations; and  
6 means for managing a vocabulary database comprising a plurality of data structures  
7 describing atomic concepts among names in an enterprise-specific vocabulary  
8 and a plurality of data structures describing relationships among the atomic  
9 concepts,  
10 wherein the plurality of data structures describing atomic concepts include a first  
11 information object data structure comprising data indicating a first reference to  
12 a first chunk in the one or more content management systems, and  
13 wherein the plurality of data structures describing relationships include a first  
14 relationship data structure describing a relationship between the first  
15 information object data structure and a second concept data structure of the  
16 plurality of data structures describing atomic concepts.

1 39. A system for arranging content for a Web page, comprising:  
2 means for managing a plurality of information chunks in a content cache, each chunk  
3 of the plurality of information chunks retrieved by a directory address; and  
4 means for managing a plurality of data structures describing atomic concepts among  
5 names in an enterprise-specific vocabulary and a plurality of data structures  
6 describing relationships among the atomic concepts in a concept cache; and  
7 means for arranging content on the Web page based at least in part on data in the  
8 concept cache.

1 40. A system for relating data stored in one or more content management systems for an  
2 enterprise, comprising:  
3 means for managing a plurality of information chunks in one or more content  
4 management systems, each chunk of the plurality of information chunks  
5 comprising a unit of data for storage and retrieval operations;  
6 means for managing a vocabulary database comprising a plurality of data structures  
7 describing atomic concepts among names in an enterprise-specific vocabulary  
8 and a plurality of data structures describing relationships among the atomic  
9 concepts, and  
10 means for arranging content in a document based at least in part on data in the  
11 vocabulary database, the content based at least in part on an information chunk  
12 of the plurality of information chunks.

1 41. A system for relating data stored in one or more content management systems for an  
2 enterprise, comprising:  
3 means for managing a plurality of information chunks in one or more content  
4 management systems, each chunk of the plurality of information chunks  
5 comprising a unit of data for storage and retrieval operations;  
6 means for managing a vocabulary database comprising a plurality of data structures  
7 describing atomic concepts among names in an enterprise-specific vocabulary  
8 and a plurality of data structures describing relationships among the atomic  
9 concepts;  
10 means for generating and storing a first subset of the plurality of information chunks  
11 into a first content cache for managing content of a Web page; and  
12 a means for generating and storing a second subset of the first content cache into a  
13 second content cache for staging content for the Web page for replication to  
14 one or more Web servers,  
15 wherein the plurality of data structures describing atomic concepts include a first  
16 information object data structure comprising data indicating a first reference to  
17 a first chunk in the one or more content management systems, and

18 wherein the plurality of data structures describing relationships include a first  
19 relationship data structure describing a relationship between the first  
20 information object data structure and a second concept data structure of the  
21 plurality of data structures describing atomic concepts.

1 42. A computer system for relating data stored in one or more content management  
2 systems for an enterprise, the system comprising:  
3 a computer-readable medium for storing a plurality of information chunks in one or  
4 more content management systems, each chunk of the plurality of information  
5 chunks comprising a unit of data for storage and retrieval operations, and a  
6 vocabulary database comprising a plurality of data structures describing  
7 atomic concepts among names in an enterprise-specific vocabulary and a  
8 plurality of data structures describing relationships among the atomic  
9 concepts, wherein the plurality of data structures describing atomic concepts  
10 include a first information object data structure comprising data indicating a  
11 first reference to a first chunk in the one or more content management  
12 systems, and the plurality of data structures describing relationships include a  
13 first relationship data structure describing a relationship between the first  
14 information object data structure and a second concept data structure of the  
15 plurality of data structures describing atomic concepts; and  
16 one or more processors configured for managing the plurality of information chunks,  
17 and managing the vocabulary database.

1 43. A computer system for arranging content for a Web page, the system comprising:  
2 a computer-readable medium for storing a plurality of information chunks in a content  
3 cache, each chunk of the plurality of information chunks retrieved by a  
4 directory address; and a plurality of data structures describing atomic concepts  
5 among names in an enterprise-specific vocabulary and a plurality of data  
6 structures describing relationships among the atomic concepts in a concept  
7 cache; and

8 one or more processors configured as an interface for managing the plurality of  
9 information chunks in the content cache, managing the plurality of data  
10 structures in the concept cache, and arranging content on the Web page based  
11 at least in part on data in the concept cache.

1 44. A computer system for relating data stored in one or more content management  
2 systems for an enterprise, the system comprising:  
3 a computer-readable medium for storing a plurality of information chunks in one or  
4 more content management systems, each chunk of the plurality of information  
5 chunks comprising a unit of data for storage and retrieval operations, and a  
6 vocabulary database comprising a plurality of data structures describing  
7 atomic concepts among names in an enterprise-specific vocabulary and a  
8 plurality of data structures describing relationships among the atomic  
9 concepts; and  
10 one or more processors configured for managing the plurality of information chunks,  
11 managing the vocabulary database, and arranging content in a document based  
12 at least in part on data in the vocabulary database, the content based at least in  
13 part on an information chunk of the plurality of information chunks.

1 45. A computer system for relating data stored in one or more content management  
2 systems for an enterprise, the system comprising:  
3 a computer-readable medium for storing a plurality of information chunks in one or  
4 more content management systems, each chunk of the plurality of information  
5 chunks comprising a unit of data for storage and retrieval operations, and a  
6 vocabulary database comprising a plurality of data structures describing  
7 atomic concepts among names in an enterprise-specific vocabulary and a  
8 plurality of data structures describing relationships among the atomic  
9 concepts, wherein the plurality of data structures describing atomic concepts  
10 include a first information object data structure comprising data indicating a  
11 first reference to a first chunk in the one or more content management  
12 systems, and the plurality of data structures describing relationships include a  
13 first relationship data structure describing a relationship between the first  
14 information object data structure and a second concept data structure of the  
15 plurality of data structures describing atomic concepts; and  
16 one or more processors configured for managing the plurality of information chunks,  
17 managing a vocabulary database, generating and storing a first subset of the  
18 plurality of information chunks into a first content cache for managing content  
19 of a Web page, and generating and storing a second subset of the first content  
20 cache into a second content cache for staging content for the Web page for  
21 replication to one or more Web servers.

1 46. A method of retrieving and delivering related data that is stored in one or more  
2 content management systems for an enterprise, the method comprising the steps of:  
3 creating and storing a plurality of information chunks in one or more content  
4 management systems, each chunk of the plurality of information chunks  
5 comprising a unit of data for storage and retrieval operations; and

6 creating and storing a vocabulary database comprising a plurality of data structures  
7 describing a plurality of atomic concepts among names in an enterprise-  
8 specific vocabulary and a plurality of data structures describing relationships  
9 among the atomic concepts, wherein the plurality of data structures describing  
10 atomic concepts include a first information object data structure comprising  
11 data indicating a first reference to a first chunk in the one or more content  
12 management systems, and wherein the plurality of data structures describing  
13 relationships include a first relationship data structure describing a relationship  
14 between the first information object data structure and a second concept data  
15 structure of the plurality of data structures describing atomic concepts,  
16 wherein the second concept data structure is associated with one or more  
17 second chunks of information;  
18 receiving a query for a first concept that is among the plurality of atomic concepts;  
19 selecting the first chunk and all of the second chunks that are associated with the  
20 second concept data structure and related to the first chunk by the relationship  
21 described in the first relationship data structure;  
22 returning the first chunk and all of the second chunks for use in one or more electronic  
23 documents relating to the first concept.